

I. Remarks**Claims:**

Claims 2-3, 5-16, 20-29 and 31-39 are pending following the foregoing amendment. Applicant herein directs cancellation of Claims 1, 4, 17-19 and 30, and due to restriction requirement, Claims 40-49 are similarly cancelled without prejudice to filing continuation applications thereon.

Claims 2 and 16 are herein amended as suggested by the Examiner. The phrase "is correlated" has been replaced in Claims 2 and 16 with the term "corresponds." Claim 16 is amended for clarification by replacing "an increase in the amount of" with --a decrease in the rate of decrease in-- as suggested by the Examiner. Additional clarifying amendments to Claim 16 include insertion of the phrase "relative to the absence" subsequent to the phrase --in the presence--. Accordingly, no new matter is added.

Claim 2 is further amended at the preamble by inserting the term "plant" prior to --squalene synthase activity--. Claim 16 is further amended at the preamble by deleting the phrase "or promoter," inserting the term "plant" prior to --squalene synthase--, and inserting the phrase "as a candidate herbicide" after --squalene synthase--. The term "plant" is also inserted prior to --squalene synthase-- at steps (a) and (c) of Claim 16, and the phrase "and candidate herbicide" is inserted at the end of Claim 16. Support for the amendments to Claims 2 and 16 are found throughout the specification and claims as originally filed, especially at Claims 4 and 19, 2nd paragraph of the summary on page 5, and Example 1 on page 33. Accordingly, no new matter is added.

Claim 29 is herein amended by deleting the phrases "promoting or" and "fungal and/or animal" at the preamble. Similar phrases, "promote or" and "fungal or animal," are deleted from steps (c) and (f) of Claim 29. The phrase "the plant" is inserted prior to --squalene synthase-- at step (c) of Claim 29. Support for the amendments are found throughout the specification and claims as originally filed, especially at Claim 30, 2nd paragraph of the summary on page 5, and Example 1 on page 33. Accordingly, no new matter is added.

II. Claim Rejections - 35 USC § 112, 2nd Paragraph

Claims 1-28 and 30-34 are rejected under 35 USC § 112, 2nd paragraph for failing to particularly point out and distinctly claim the subject matter of the invention. The 35

USC § 112, 2nd paragraph rejection of the claims is obviated by the foregoing amendment.

III. Claim Rejections - 35 USC § 103(a)

Claims 1-39 are rejected under 35 USC § 103(a) as being unpatentable over Robinson (US Patent 5,589,372) in view of Wolf et al. [Analytical Biochemistry (1991) 192, 78-81], Nakashima et al. (PNAS (1992) 92, 2328-32), and the state of the art as exemplified by the cited references and Ciosek et al. (J. Biol. Chem. (1993) 268 24832-7). Applicants respectfully assert that the cited combination fails to render obvious Claims 2-3, 5-16, 20-29 and 31-39, as amended. As described in the following remarks, a motivation for combination and a reasonable expectation of success are lacking for the cited combination, and the references, even in combination, also fail to teach every limitation of Applicants' claimed invention. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 USC § 103(a) rejection.

To establish a *prima facie* case of obviousness, the Patent Office must satisfy that the prior art relied upon, coupled with the knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or to combine references. *In re Fine*, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988); *In re Skinner*, 2 USPQ2d 1788, 1790 (Bd. Pat. App. & Int. 1986). *Prima facie* obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention in the absence of such a teaching, suggestion, or incentive supporting the combination. *In re Geiger*, 2 USPQ2d 1276 (Fed. Cir. 1987). Moreover, the mere fact that references can be combined does not render the combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 16 USPQ2d 1430 (Fed. Cir. 1990); *In re Fritch*, 23 USPQ2d 1780 (Fed. Cir. 1992). In the case of *In re Mills*, the Court of Appeals for the Federal Circuit reversed the Patent Office's finding of obviousness, holding that while the prior art invention was capable of being modified to achieve the claimed invention, there was no suggestion of the desirability of the modification within the prior art reference itself. *Mills*, 16 USPQ2d at 1432.

Another requirement for a finding of obviousness is that the proposed

modification or combination of the prior art must have a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. See *Amgen, Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991). The teachings or suggestions, as well as the expectation of success, must come from the prior art, not from the applicant's disclosure. See *In re Vaeck*, 20 USPQ2d 1438, 1442 (Fed. Cir. 1991). As the Court of Appeals for the Federal Circuit has set forth in *Vaeck*, where claimed subject matter has been rejected as obvious in view of a combination of prior art references, a proper analysis must include the consideration of whether the prior art would also have revealed that in so carrying out the process, those of ordinary skill in the art would have a reasonable expectation of success. *Id.* The court also expressly stated "the reasonable expectation of success must be founded in the prior art, and not in the applicant's disclosure." *Id.*

To establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. *In re Royka*, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). A statement by the Patent Office that modifications of the prior art to meet the claimed invention would have been well within the ordinary skill of the art at the time the claimed invention was made, because the references teach that all aspects of the claimed invention were individually known in the art, is not sufficient to establish a *prima facie* case of obviousness, without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993). Moreover, it is not relevant that any individual element of the claimed invention was known in the art. *Jones v. Hardy*, 717 F.2d 1524, 220 USPQ 1021, 1024 (Fed. Cir. 1984) ("[I]t is irrelevant in determining obviousness that all or other aspects of the claim may be well known in the art.").

In light of the foregoing, Applicants respectfully submit that Claims 2-3, 5-16, 20-29 and 31-39, as amended, are not obvious in view of the cited art. The combination of Robinson, Wolf et al., Nakashima et al., and Ciosek et al. is improper, as there is no suggestion of the desirability for combination within the prior art reference. In addition, an expectation of success is not taught or suggested in the prior art for the combination of references. Furthermore, even if the references were combined as suggested by the Examiner, the combination fails to teach or suggest every element of Applicants' claimed

invention.

The instant invention discloses that squalene synthase activity is essential for *Arabidopsis* growth and development. Accordingly, Applicants' disclosure of squalene synthase as being essential for plant growth indicates the enzyme as a desirable target for the identification of herbicides. The claimed invention, as amended, is directed to the use of squalene synthase enzymes from plant species for the identification of inhibitory compounds as potential herbicides. In contrast, none of Robinson, Wolf et al., Nakashima et al., nor Ciosek et al. teach or suggest the desirability of inhibiting *plant* squalene synthase. Applicants respectfully assert that there is no explicit or implied suggestion in Robinson for combination with the squalene synthase of Nakashima et al. or Ciosek et al. as suggested by the Examiner.

In the absence of knowledge of Applicants' disclosure, one of ordinary skill in the art, through a reading of the above-cited references, would not have a reasonable expectation of success for the combination the references. One of ordinary skill in the art would have reasonable doubt as to the usefulness of plant squalene synthase as a herbicide target. The Examiner points to column 5, lines 38-52, of Robinson as teaching the many benefits of eliminating squalene synthase activity, as though these benefits disclose the usefulness of Applicants' claimed invention. To the contrary, column 5, lines 38-52, of Robinson disclose over-production of various desirable chemicals in plants and insects modified to contain only inactivated copies of squalene synthase coding region. The benefits of squalene synthase inactivation described in Robinson are in direct contrast to that claimed by Applicants, i.e. herbicidal effects on the plant host itself. Accordingly, one of ordinary skill in the art would not have a reasonable expectation of success in reaching Applicants' invention by combining the proposed references.

In addition to the lack of motivation and reasonable expectation of success for the suggested combination, the combined references also fail to teach every limitation of Applicants' claimed invention, as amended. Specifically, none of the above-cited references, alone or in combination teach or suggest squalene synthase as a herbicide target. Therefore, the combination of Robinson, Wolf et al., Nakashima et al., and Ciosek et al., along with any additional knowledge possessed by one of ordinary skill in the art, fails to teach or suggest every limitation of Applicants' claimed invention. Accordingly, the

proposed combination necessarily fails to render obvious Applicants' claimed invention, as amended.

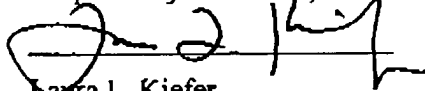
In light of the foregoing, Applicants respectfully submit that Examiner's asserted motivation for combination of the cited references is incorrect. Furthermore, one of ordinary skill in the art would not have expected a reasonable chance of success in the combination, and even in combination the cited references fail to teach every element of Applicants' claimed invention. Accordingly, Applicants respectfully request reconsideration and withdrawal of the 35 USC § 103(a) rejection.

IV. Concluding Remarks

The purpose of Applicants' claimed invention is not taught or suggested by the cited references, nor is there any suggestion or teaching that would lead one skilled in the relevant art to combine references in a manner that would meet the purpose of the claimed invention. Because the cited references do not teach or suggest the purpose of the claimed invention, Applicants respectfully submit that the claimed invention, as amended, patentably distinguishes over the prior art. Accordingly, Applicants respectfully request withdrawal of the 35 USC § 103(a) rejection of amended Claims 2-3, 5-16, 20-29 and 31-39.

Applicants respectfully submit that amended Claims 2-3, 5-16, 20-29 and 31-39 are in condition for allowance. Accordingly, reconsideration of the application and passage to allowance are respectfully requested. The Examiner is respectfully urged to call the undersigned at (919) 425-3795 to discuss the claims in an effort to reach mutual agreement which will be effective to define the patentable subject matter if the present claims are not deemed adequate for their intended purpose.

Respectfully submitted,



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